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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/817,403

04/01/2004

Kurt Burger

10191/3687

3199

26646 7590 02/26/2010

KENYON & KENYON LLP  
ONE BROADWAY  
NEW YORK, NY 10004

EXAMINER

LESLIE, MICHAEL S

ART UNIT

PAPER NUMBER

3745

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DELIVERY MODE

02/26/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/817,403	<b>Applicant(s)</b> BURGER ET AL.	
	<b>Examiner</b> MICHAEL LESLIE	<b>Art Unit</b> 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,21-35,41,42 and 44-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,21-35,41,42 and 44-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 21-33, 41, 42, 44, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over in Volz (5839349) view of Massler et al (DE 10018143) and Applicant's prior art admission (Page 2, Lines 20-24).

Volz discloses a pump device having a metal piston (2, 3) and an elastomeric sealing element (Shown in Fig on Pistons 2, 3). Volz does not teach that at least one of the piston and seal are coated with a coating containing of at least one of halogen-, silicon-, carbon-containing, and metal-organic monomers, wherein the coating includes an inner adhesive layer including one of chromium and silicon, at least one intermediate layer including one of chromium, tungsten, silicon, and carbon, and one of an outer, metal-free functional layer of diamond-like carbon and an outer, metal-containing functional layer including tungsten carbide, wherein a layer thickness of the three layers together is approximately 0.5 micrometers to 4 micrometers at a micro-hardness of approximately 4 to 40 GPa and a coefficient of friction of the functional layer amounts to approximately 0.05 to 0.3, or that the elastomeric material includes one of EPDM, viton, turcun, and rubber variants of EPDM.

Massler et al discloses a coating for a pump device having at least one of a piston and sealing elements to seal the pump piston (paragraph [0003]), the at least one of the pump piston

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and sealing elements having a coating containing of at least one of halogen-, silicon-, carbon-containing, and metal-organic monomers, wherein the coating includes an inner adhesive layer including one of chromium and silicon, at least one intermediate layer including one of chromium, tungsten, silicon, and carbon, and one of an outer, metal-free functional layer of diamond-like carbon and an outer, metal-containing functional layer including tungsten carbide (see Abstract), wherein a layer thickness of the three layers together is approximately 0.5 micrometers to 4 micrometers at a micro-hardness of approximately 4 to 40 GPa (Paragraph [0025]) and a coefficient of friction of the functional layer amounts to approximately 0.05 to 0.3 (Paragraph [0103]).

Applicant has admitted, on Page 2, Lines 20-24, that EPDM is a typical material for sealing rings.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the pump device of Volz to have at least one of the piston and seal coated with a coating containing at least one of halogen-, silicon-, carbon-containing, and metal-organic monomers, wherein the coating includes an inner adhesive layer including one of chromium and silicon, at least one intermediate layer including one of chromium, tungsten, silicon, and carbon, and one of an outer, metal-free functional layer of diamond-like carbon and an outer, metal-containing functional layer including tungsten carbide, wherein a layer thickness of the three layers together is approximately 0.5 micrometers to 4 micrometers at a micro-hardness of approximately 4 to 40 GPa and a coefficient of friction of the functional layer amounts to approximately 0.05 to 0.3 as taught by Massler et al, wherein the elastomeric material includes one of EPDM, viton, turcun, and rubber variants of EPDM as taught by Applicant's

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prior art admission for the purpose of improving efficiency and wear resistance of the pump device.

Claims 34, 35, 47, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Volz (5839349) in view of Massler et al (DE 10018143) as applied to claims 1 and 45 above, and further in view of Harada (5577896).

Volz, as modified, discloses a pump device as described above, but does not teach that the sealing element is a quad-ring having concavely shaped surfaces and four annularly integrated sealing lips.

Harada discloses a pump having a piston (440) and sealing element (446) wherein the sealing element is a quad-ring having concavely shaped surfaces and four annularly integrated sealing lips.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the pump device of Volz, as modified, to have the sealing element be a quad-ring having concavely shaped surfaces and four annularly integrated sealing lips as taught by Harada for the purpose of improving sealing performance.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LESLIE whose telephone number is (571)272-4819. The examiner can normally be reached on M-F 8:00am - 4:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ML  
February 24, 2010

/Michael Leslie/  
Primary Examiner, Art Unit 3745